n-F

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,538	09/09/2000	Paul Robert Williams	1136/190-P00028US	3472

757 7590 08/25/2006

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610

EXAMINER	
CHAU, COREY P	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/658,538	WILLIAMS, PAUL ROBERT	
	Examiner	Art Unit	
	Corey P. Chau	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 6-15, 19-22, 26-34,and 38-47* is/are rejected.

7)☒ Claim(s) *16-18,23-25,35-37 and 48-50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 26 is objected to because of the following informalities: in line 17, recites "the **at least one** digital filter", which should be replaced with "the **single** digital filter". Appropriate correction is required.

2. Claim 38 is objected to because of the following informalities: in line, 19, recites "a predetermined amount,", which should be replaced with "a predetermined amount**.**". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2004/0120535 to Woods.

5. Regarding Claim 1, Woods discloses a method of eliminating acoustical feedback in a system (Fig. 1) comprising:

determining at least one parameter for at least one notch tilter (Fig. 1; page 3, paragraph 0035);

adjusting the at least one notch tilter based on the at least one parameter (Fig. 1; page 3, paragraphs 0035-0036);

processing acoustic signals through the at least one notch filter (Fig. 1; page 3, paragraphs 0035-0036);

testing an effect of the at least one notch filter in the system by determining the amount of reduction in amplitude of a frequency being tested (Fig. 1; page 3, paragraph 0035); and

bypassing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least a predetermined value (Fig. 1; page 2, paragraph 0029).

6. Claims 1-4, and 6-15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5245665 to Lewis et al. (hereafter as Lewis).

7. Regarding Claim 1, Lewis discloses a method of eliminating acoustical feedback in a system comprising:

determining at least one parameter for at least one notch tilter (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

adjusting the at least one notch filter based on the at least one parameter (Figs. 1, 15, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

processing acoustic signals through the at least one notch filter (Figs. 1, 15, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

testing an effect of the at least one notch filter in the system by determining the amount of reduction in amplitude of a frequency being tested (Figs. 1, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63); and

bypassing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least a predetermined value (Figs. 16, 18, and 21).

8. Regarding Claim 2, Lewis discloses the determining at least one parameters step comprises:

converting the acoustic signals by transform algorithm into at least one frequency spectrum comprising a plurality of frequency bins (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

selecting at least one frequency bin to be a candidate frequency bin (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

discriminating the candidate frequency bin to determine the candidate frequency bin indicates acoustic feedback (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63); and

determining at least one parameter for at least one notch filter based on the candidate frequency bin (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

9. Regarding Claim 3, Lewis discloses the step of selecting at least one frequency bin to be a candidate frequency bin comprises: calculating a plurality of prominence values corresponding to a plurality of ballistics histories for the plurality of frequency bins wherein the plurality of prominence values with decreasing ballistics histories are reduced, and selecting at least one frequency bin to be at least on candidate frequency bin based on the prominence values of the ballistics history of the respective frequency bin (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

10. Regarding Claim 4, Lewis discloses the discriminating step further comprises comparing the candidate frequency bin to a predetermined magnitude, if the respective candidate frequency bin value is less than the predetermined magnitude, removing the candidate frequency bin from the selection process (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

11. Regarding Claim 6, Lewis discloses the adjusting step comprises: setting the at least one notch filter to a candidate frequency; setting the at least one notch tilter to a bandwidth surrounding the candidate frequency; and setting the at least one notch filter

to a predetermined notch depth (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63; column 10, line 58 to column 11, line 55).

12. Regarding Claim 7, Lewis discloses method of reducing unwanted acoustical feedback in a space having at least one microphone for transducing acoustic signals into electrical input signals and at least one speaker for transducing electrical output signals into acoustic signals; the method comprising:

converting electrical input signals to corresponding digital input signals (Fig. 1);

examining the digital input signals for at least one candidate signal of unwanted acoustical feedback (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

adjusting a single digital filter in response to a detection of the at least one candidate signal of unwanted acoustical feedback (Figs. 1, 15, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

processing the digital input signals through the single digital filter to generate digital output signals (Figs. 1, 15, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

converting the digital output signals to electrical output signals (Fig. 1);

testing the electrical output signals by broadcasting the electrical output signals through the at least one speaker to generate new input signals and analyzing the effect of processing the digital input signals (Figs. 1, 16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63); and

readjusting the single digital filter by adjustment of the single digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced (Figs. 1, 15, 16, 18, 20, 21, and 24; column 9, line 57 to column 10, line 25; column 12, lines 35-63; column 15, lines 16-41).

13. Regarding Claim 8, Lewis discloses adjustment of the depth of the single digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is reduced by a predetermined amount (Figs. 1, 15, 16, 18, 20, 21, and 24).

14. Regarding Claim 9, Lewis discloses transforming the digital input signals into a frequency spectrum to produce a plurality of bin values wherein each bin value represents a function of an amplitude of the digital input signals across a frequency spectrum bandwidth (Figs. 1, 14-16, 18, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

15. Regarding Claim 10, Lewis discloses the function is a sum of a square of a real component of the amplitude of the digital input signals and a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to take the sum of a square of a real component of the amplitude and a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 1, 15, 16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

16. Regarding Claim 11, Lewis discloses the function is a square root of a sum of a square of a real component of the amplitude of the digital input signals plus a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to

take the square root of a sum of a square of a real component of the amplitude plus a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 1, 15, 16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

17. Regarding Clam 12, Lewis discloses establishing a set of candidates comprising a predetermined number of bin values with largest magnitudes, testing each candidate in the set of candidates by determining an acoustical significance of each candidate and removing the respective candidate from the set of candidates if the respective candidate is not acoustically significant, and determining the at least one candidate signal of unwanted acoustical feedback from the set of candidates (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

18. Regarding Claim 13, Lewis discloses determining an average value which is a function of the magnitudes of the predetermined number of bin values; comparing the bin value of each candidate in the set of candidates to an absolute value and removing the respective candidate from the set of candidates if the respective bin value of the respective candidate is less than the absolute value; and comparing the bin value of each candidate to a relative value, and removing the respective candidate from the set of candidates if the bin value of the respective candidate is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

19. Regarding Claim 14, Lewis discloses the relative multiplier is a function of the magnitudes of the predetermined number of bin values (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

20. Regarding Claim 15, Lewis discloses the magnitudes are calculated by a process which includes: transforming the digital input signals into a frequency spectrum to generate a plurality of new bin values wherein each new bin value represents the function of an amplitude of the digital input signal across the frequency spectrum bandwidth (Figs. 14, 15, 20, and 21; column 9, line 24 to column 10, line 25; column 12, lines 35-63), comparing the new bin value to at least one of the predetermine number of bin values (Figs. 14, 15, 20, and 21; column 9, line 24 to column 10, line 25; column 12, lines 35-63), setting at least one of the predetermine number of bin values to the new bin value when the new bin value is less tan the at least one of the predetermined number of bin values (Figs. 14, 15, 20, and 21; column 9, line 24 to column 10, line 25; column 12, lines 35-63), and setting the at least one of the predetermined number of bin values to a filtered value when the new bin value is greater than the at least one of the predetermined number of bin values (Figs. 14, 15, 20, and 21; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. Claims 19-22, 26-34, and 38-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5245665 to Lewis.

23. Regarding Claim 19, Lewis discloses a method of reducing unwanted acoustical feedback in a plurality of sound signals, the method comprising:

sampling the plurality of sound signals at predetermined intervals to create a set of sampled sound signals (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

transforming a sound signal from the set of sampled sound signals, to a frequency spectrum comprising a plurality of frequency bins, each bin having a new bin value which is a function of a magnitude of a frequency of the sound signal over a predetermined frequency width (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

comparing each new bin value to an existing bin value (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

setting the bin value to a new bin value when the new bin value is less than the existing bin value (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

setting the bin value to a filtered value when the new bin value is greater than the existing bin value (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

selecting a set of candidate frequency from the bin value having the largest values (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

testing an acoustic significance of each candidate frequency in the set of candidate frequencies and removing a respective candidate frequency from the set of candidate frequencies if the respective candidate is not acoustically significant, such that at least one candidate feedback frequency is determined (Figs. 1, 14, 15, 20, and 21; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

adjusting at least one notch filter to filter the at least one candidate feedback frequency (Figs. 1, 14-16, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63; column 15, lines 16-40); and

processing the plurality of sound signals through the at least one notch filter (Figs. 1, 14-16, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63; column 15, lines 16-40).

Lewis does not expressly disclose adjusting at least one notch filter **at a first processing rate** to filter the at least one candidate feedback frequency; and processing

the plurality of sound signals through the at least one notch filter **at a second processing rate different than the first processing rate**. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Lewis to have the adjustment of the at least one notch filter slower than processing a plurality of sound signals through the at least one notch filter such that it prevent abrupt changes in order prevent erroneous adjustment of the at least one notch filter and reduce complexity.

Lewis as modified discloses readjusting the at least one notch filter to filter for the at least one candidate frequency wherein the at least one notch filter's depth is adjusted if the at least one candidate feedback frequency has not been reduced by a predetermined amount, such that unwanted acoustical feedback is reduced (Figs. 14-16, 18, 20, 21, and 24; column 9, line 57 to column 10, line 25; column 15, lines 16-40).

24. Regarding Claim 20, Lewis as modified discloses the readjusting step further comprises adjustment of the at least one notch filter's depth if the at least one candidate feedback frequency has been reduced by a predetermined amount (Figs. 1, 14-16, 20, 21, and 24; column 5, lines 34-63; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

25. Regarding Claim 21, Lewis as modified the testing an acoustical significance of each candidate frequency comprises: determining an average value which is a function

of an average of the plurality of bin values; comparing the bin value of each candidate frequency in the set of candidate frequencies to an absolute value and removing the respective candidate frequency from the set of candidate frequencies if a respective bin value of the respective candidate frequency is less than the absolute value; and comparing the respective bin value of each candidate frequency to a relative value, and removing the respective candidate frequency from the set of candidate frequencies if the respective bin value of the respective candidate frequency is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

26. Regarding Claim 22, Lewis as modified discloses the relative multiplier is a function of the magnitudes of the plurality of frequency bin values (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

27. Regarding Claim 26, Lewis discloses a system for reducing unwanted acoustical feedback comprising:

at least one processor (Fig. 1);

at least one memory accessible to the at least one processor (Fig. 1; column 6, lines 40-68); and

programming comprising instructions for:

examining a plurality of digital input signals for at least one candidate signal of unwanted acoustical feedback (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63);

adjusting a single digital filter in response to detection of the at least one candidate signal (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63); and

processing the digital input signals through the single digital filter to generate digital output signals (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63).

Lewis does not expressly disclose adjusting a single digital filter at **a first processing rate** in response to detection of the at least one candidate signal; processing the digital input signals through the single digital filter at **a second processing rate different from the first processing rate** to generate digital output signals. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Lewis to have the adjustment of the single digital filter slower than processing a plurality of sound signals through the single digital filter such that it prevent abrupt changes in order prevent erroneous adjustment of the single digital filter and reduce complexity.

Lewis as modified discloses:

converting the digital output signals to audio output signals (Fig. 1);

testing the audio output signals by broadcast of the audio output signals through a speaker to generate new audio input signals and analysis the effect of processing the digital input signals (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63); and

readjusting the single digital filter by adjustment of a depth of the single digital filter if a magnitude of the at least one candidate signal is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced (Figs. 14-16, 18, 20, 21, and 24; column 9, line 57 to column 10, line 25; column 15, lines 16-40).

28. Claim 27 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

29. Claim 28 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

30. Claim 29 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

31. Claim 30 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

32. Claim 31 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

33. Claim 32 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

34. Claim 33 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

35. Claim 34 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

36. Regarding Claim 38, Lewis discloses an apparatus for reducing unwanted acoustical feedback in a space having at least one microphone for transducing acoustic signals into electrical input signals and at least one speaker for transducing electrical output signals into acoustic signals (Fig. 1), the apparatus comprising:

an analog-to-digital converter which converts the electrical input signals to digital input signals (Fig. 1);

at least one processor coupled to the analog-to-digital converter (Fig. 1);

a memory accessible to the at least one processor for storing software modules (Fig. 1; column 6, lines 40-68), including an examining module to examine the digital input signals for candidate feedback frequencies (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63), and

at least one digital notch filter implemented in the at least one processor which processes the digital input signals and wherein the at least one processor determines parameters for the at least one digital notch filter in response to a detection of at least one candidate frequency in at least one of the digital input signal (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 12, lines 35-63).

Lewis does not expressly disclose at least one digital notch filter implemented in the at least one processor which processes the digital input signals at **a first**

processing rate and wherein the at least one processor determines parameters for the at least one digital notch filter **at a second processing rate different from the first processing rate** in response to a detection of at least one candidate frequency in at least one of the digital input signal. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Lewis to have the adjustment of the at least one digital notch filter slower than processing a plurality of sound signals through the at least one digital notch filter such that it prevent abrupt changes in order prevent erroneous adjustment of the at least one digital notch filter and reduce complexity.

Lewis as modified discloses:

a digital to analog converter (Fig. 1) coupled to the processor configured to convert the digital output signals to electrical output signals, and

a testing module which adjust a notch depth parameter if a magnitude of the at least one candidate frequency is not reduced by a predetermined amount (Figs. 1, 14-16, 18, 20, 21, and 24; column 9, line 24 to column 10, line 25; column 10, line 58 to column 11, line 55; column 12, lines 35-63; column 15, lines 16-40).

37. Claim 39 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

38. Claim 40 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

39. Claim 41 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

40. Claim 42 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

41. Claim 43 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

42. All elements of Claim 44 are comprehended by Claim 38. Claim 44 is rejected for the reasons stated above apropos to Claim 38.

43. Claim 45 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

44. Claim 46 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

45. Claim 47 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

46. Claims 1-4, 6, and 38-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US. Patent No. 5677987 to Seki et al (hereafter as Seki).

47. Regarding Claim 1, Seki discloses a method of eliminating acoustical feedback in a system (Figs. 2, 12, 14, and 16) comprising:

determining at least one parameter for at least one notch tilter (Figs. 2, 12, 14, and 16; column 6, lines 28-55);

adjusting the at least one notch tilter based on the at least one parameter (Figs. 2, 12, 14, and 16; column 6, lines 28-63);

processing acoustic signals through the at least one notch filter (Figs. 2, 12, 14, and 16; column 6, lines 28-63); and

testing an effect of the at least one notch filter in the system by determining the amount of reduction in amplitude of a frequency being tested (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 63).

Seki does not expressly disclose bypassing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least a predetermined value. However, the Examiner takes Official Notice that it is well known in the art to bypass the notch filter if it is determined that the amplitude of the frequency being tested is a desired sound signal and not feedback in order provide the desired sound signal to the out terminal without erroneously removing desired sound signal. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Seki to bypass the notch filter if it is determined that the amplitude of the frequency being tested is a desired sound signal and not feedback in order provide the desired sound signal to the out terminal without erroneously removing desired sound signal.

48. Regarding Claim 2, Seki as modified discloses the determining at least one parameters step comprises:

converting the acoustic signals by transform algorithm into at least one frequency spectrum comprising a plurality of frequency bins (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27);

selecting at least one frequency bin to be a candidate frequency bin (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27);

discriminating the candidate frequency bin to determine the candidate frequency bin indicates acoustic feedback (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 55); and

determining at least one parameter for at least one notch filter based on the candidate frequency bin (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 63).

49. Regarding Claim 3, Seki as modified discloses the step of selecting at least one frequency bin to be a candidate frequency bin comprises: calculating a plurality of prominence values corresponding to a plurality of ballistics histories for the plurality of frequency bins wherein the plurality of prominence values with decreasing ballistics histories are reduced, and selecting at least one frequency bin to be at least on candidate frequency bin based on the prominence values of the ballistics history of the respective frequency bin (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27).

50. Regarding Claim 4, Seki as modified discloses the discriminating step further comprises comparing the candidate frequency bin to a predetermined magnitude, if the respective candidate frequency bin value is less than the predetermined magnitude, removing the candidate frequency bin from the selection process (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27).

51. Regarding Claim 6, Seki as modified discloses the adjusting step comprises: setting the at least one notch filter to a candidate frequency; setting the at least one notch tilter to a bandwidth surrounding the candidate frequency; and setting the at least one notch filter to a predetermined notch depth (Figs. 2, 12, 14, and 16; column 6, lines 28-63).

52. Regarding Claim 38, Seki discloses an apparatus for reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) in a space having at least one microphone for transducing acoustic signals into electrical input signals (i.e. input terminal 1 is connected to an external microphone) and at least one speaker for transducing electrical output signals into acoustic signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22), the apparatus comprising:

an analog-to-digital converter (2) which converts the electrical input signals to digital input signals;

at least one processor coupled to the analog-to-digital converter (Figs. 2, 12, 14, and 16);

a memory accessible to the at least one processor for storing software modules (4,10,841), including an examining module to examine the digital input signals for candidate feedback frequencies (7,8), and

at least one digital notch filter (3) implemented in the at least one processor which processes the digital input signals and wherein the at least one processor determines parameters for the at least one digital notch filter in response to a detection

of at least one candidate frequency in at least one of the digital input signal (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27).

Seki does not expressly disclose at least one digital notch filter (3) implemented in the at least one processor which processes the digital input signals at **a first processing rate** and wherein the at least one processor determines parameters for the at least one digital notch filter **at a second processing rate different from the first processing rate** in response to a detection of at least one candidate frequency in at least one of the digital input signal. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Seki to have the adjustment of the at least one digital notch filter slower than processing a plurality of sound signals through the at least one digital notch filter such that it prevent abrupt changes in order prevent erroneous adjustment of the at least one digital notch filter and reduce complexity.

Seki as modified discloses:

a digital to analog converter (5) coupled to the processor configured to convert the digital output signals to electrical output signals, and

a testing module which adjust a notch depth parameter if a magnitude of the at least one candidate frequency is not reduced by a predetermined amount (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

53. Claim 39 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

54. Claim 40 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

55. Claim 41 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

56. Claim 42 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

57. Claim 43 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

58. All elements of Claim 44 are comprehended by Claim 38. Claim 44 is rejected for the reasons stated above apropos to Claim 38.

59. Claim 45 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

60. Claim 46 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

61. Claim 47 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

62. Claims 7-15, 19-22, and 26-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US. Patent No. 5677987 to Seki in view of U.S. Patent No. 5910994 to Lane et al. (hereafter as Lane).

63. Regarding Claim 7, Seki discloses method of reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) in a space having at least one microphone for transducing acoustic signals into electrical input signals (i.e. input terminal 1 is connected to an external microphone) and at least one speaker for transducing electrical output signals into acoustic signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22); the method comprising:

converting electrical input signals to corresponding digital input signals (2);

examining the digital input signals for at least one candidate signal of unwanted acoustical feedback (7,8);

adjusting a single digital filter in response to a detection of the at least one candidate signal of unwanted acoustical feedback (4,9);

processing the digital input signals through the single digital filter to generate digital output signals (3); and

converting the digital output signals to electrical output signals (5);

testing the electrical output signals by broadcasting the electrical output signals through the at least one speaker to generate new input signals and analyzing the effect of processing the digital input signals (Figs. 2, 12, 14, and 16).

Seki does not expressly disclose readjusting **the single digital filter** by adjustment of the single digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced. Lane discloses a method

and apparatus for suppressing acoustic feedback in an audio system, comprising a bank of notch filters can be configured accordingly to attenuate detected feedback. In the case where the number of notch filters is limited, an allocation/de-allocation scheme can be implemented to optimize the attenuation of the feedback with the limited number of filters. This allocation/de-allocation scheme may include a first set of notch filters that are configured to a set of feedback frequencies that are inherent to the system, and thus likely to remain constant during use. In this case, the allocation/de-allocation scheme may also include a second set of notch filters that are designated for feedback components that change regularly based on different variables in the system. The second set of notch filters would be re-configured regularly, while the first set may be static once initially configured (column 4, lines 5-20). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Seki with the teaching of Lane to incorporate an allocation/de-allocation scheme to optimize the attenuation of the feedback while having limited number of filters. Therefore, Seki as modified discloses readjusting **the single digital filter** by adjustment of the single digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced (Seki, Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27; column 9, lines 14-41, Lane, column 4, lines 5-20).

64. Regarding Claim 8, Seki as modified discloses adjustment of the depth of the single digital filter if a magnitude of the at least one candidate signal of unwanted

acoustical feedback is reduced by a predetermined amount (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

65. Regarding Claim 9, Seki as modified discloses transforming the digital input signals into a frequency spectrum to produce a plurality of bin values wherein each bin value represents a function of an amplitude of the digital input signals across a frequency spectrum bandwidth (7)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

66. Regarding Claim 10, Seki as modified discloses the function is a sum of a square of a real component of the amplitude of the digital input signals and a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to take the sum of a square of a real component of the amplitude and a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

67. Regarding Claim 11, Seki as modified discloses the function is a square root of a sum of a square of a real component of the amplitude of the digital input signals plus a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to take the square root of a sum of a square of a real component of the 4mplitude plus a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

68. Regarding Clam 12, Seki as modified discloses establishing a set of candidates comprising a predetermined number of bin values with largest magnitudes (841,843,844,845), testing each candidate in the set of candidates by determining an

acoustical significance of each candidate and removing the respective candidate from the set of candidates if the respective candidate is not acoustically significant, and determining the at least one candidate signal of unwanted acoustical feedback from the set of candidates (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27).

69. Regarding Claim 13, Seki as modified discloses determining an average value which is a function of the magnitudes of the predetermined number of bin values (42,46); comparing the bin value of each candidate in the set of candidates to an absolute value and removing the respective candidate from the set of candidates if the respective bin value of the respective candidate is less than the absolute value; and comparing the bin value of each candidate to a relative value, and removing the respective candidate from the set of candidates if the bin value of the respective candidate is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

70. Regarding Claim 14, Seki as modified discloses the relative multiplier is a function of the magnitudes of the predetermined number of bin values (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

71. Regarding Claim 15, Seki discloses the magnitudes are calculated by a process which includes: transforming the digital input signals into a frequency spectrum to generate a plurality of new bin values wherein each new bin value represents the function of an amplitude of the digital input signal across the frequency spectrum bandwidth (column 5, line 56 to column 6, line 26), comparing the new bin value to at

least one of the predetermine number of bin values (column 5, line 56 to column 6, line 26), setting at least one of the predetermine number of bin values to the new bin value when the new bin value is less tan the at least one of the predetermined number of bin values (column 5, line 56 to column 6, line 26), and setting the at least one of the predetermined number of bin values to a filtered value when the new bin value is greater than the at least one of the predetermined number of bin values (column 5, line 56 to column 6, line 26).

72. Regarding Claim 19, Seki discloses a method of reducing unwanted acoustical feedback in a plurality of sound signals, the method comprising:

sampling the plurality of sound signals at predetermined intervals to create a set of sampled sound signals (Figs. 2, 12, 14, and 16; column 4, line 66 to column 5, line 22);

transforming a sound signal from the set of sampled sound signals, to a frequency spectrum comprising a plurality of frequency bins, each bin having a new bin value which is a function of a magnitude of a frequency of the sound signal over a predetermined frequency width (Figs. 2, 12, 14, and 16; column 4, line 66 to column 5, line 30);

comparing each new bin value to an existing bin value (column 5, line 56 to column 6, line 26);

setting the bin value to a new bin value when the new bin value is less than the existing bin value (column 5, line 56 to column 6, line 26);

setting the bin value to a filtered value when the new bin value is greater than the existing bin value (column 5, line 56 to column 6, line 26);

selecting a set of candidate frequency from the bin value having the largest values (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 55);

testing an acoustic significance of each candidate frequency in the set of candidate frequencies and removing a respective candidate frequency from the set of candidate frequencies if the respective candidate is not acoustically significant, such that at least one candidate feedback frequency is determined (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41);

adjusting at least one notch filter to filter the at least one candidate feedback frequency (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41); and

processing the plurality of sound signals through the at least one notch filter (Figs. 2, 12, 14, and 16).

Seki does not expressly disclose adjusting at least one notch filter **at a first processing rate** to filter the at least one candidate feedback frequency; and processing the plurality of sound signals through the at least one notch filter **at a second processing rate different than the first processing rate**. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art

at the time of the invention to modify Seki to have the adjustment of the at least one notch filter slower than processing a plurality of sound signals through the at least one notch filter such that it prevent abrupt changes in order prevent erroneous adjustment of the at least one notch filter and reduce complexity.

Seki as modified does not expressly disclose readjusting the **at least one notch filter** to filter for the at least one candidate frequency wherein the at least one notch filter's depth is adjusted if the at least one candidate feedback frequency has not been reduced by a predetermined amount, such that unwanted acoustical feedback is reduced. Lane discloses a method and apparatus for suppressing acoustic feedback in an audio system, comprising a bank of notch filters can be configured accordingly to attenuate detected feedback. In the case where the number of notch filters is limited, an allocation/de-allocation scheme can be implemented to optimize the attenuation of the feedback with the limited number of filters. This allocation/de-allocation scheme may include a first set of notch filters that are configured to a set of feedback frequencies that are inherent to the system, and thus likely to remain constant during use. In this case, the allocation/de-allocation scheme may also include a second set of notch filters that are designated for feedback components that change regularly based on different variables in the system. The second set of notch filters would be re-configured regularly, while the first set may be static once initially configured (column 4, lines 5-20). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Seki as modified with the teaching of Lane to incorporate an allocation/de-allocation scheme to optimize the attenuation of the

feedback while having limited number of filters. Therefore, Seki as modified discloses readjusting the **at least one notch filter** to filter for the at least one candidate frequency wherein the at least one notch filter's depth is adjusted if the at least one candidate feedback frequency has not been reduced by a predetermined amount, such that unwanted acoustical feedback is reduced.

73. Regarding Claim 20, Seki as modified discloses the readjusting step further comprises adjustment of the at least one notch filter's depth if the at least one candidate feedback frequency has been reduced by a predetermined amount (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41).

74. Regarding Claim 21, Seki as modified the testing an acoustical significance of each candidate frequency comprises: determining an average value which is a function of an average of the plurality of bin values; comparing the bin value of each candidate frequency in the set of candidate frequencies to an absolute value and removing the respective candidate frequency from the set of candidate frequencies if a respective bin value of the respective candidate frequency is less than the absolute value; and comparing the respective bin value of each candidate frequency to a relative value, and removing the respective candidate frequency from the set of candidate frequencies if the respective bin value of the respective candidate frequency is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 26; column 7, lines 10-34).

75. Regarding Claim 22, as modified Seki discloses the relative multiplier is a function of the magnitudes of the plurality of frequency bin values (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

76. Regarding Claim 26, Seki discloses a system for reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) comprising:

at least one processor (Figs. 2, 12, 14, and 16);

at least one memory accessible to the at least one processor (10); and

programming comprising instructions for:

examining a plurality of digital input signals for at least one candidate signal of unwanted acoustical feedback (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27);

adjusting a single digital filter (3) in response to detection of the at least one candidate signal; and

processing the digital input signals through the single digital filter to generate digital output signals (Figs. 2, 12, 14, and 16).

Seki does not expressly disclose adjusting a single digital filter at **a first processing rate** in response to detection of the at least one candidate signal; processing the digital input signals through the single digital filter at **a second processing rate different from the first processing rate** to generate digital output signals. However, the examiner takes Office Notice that it is well known in the art to have the adjustment of a filter slower than processing a plurality of sound signals through the filter such that it prevent abrupt changes in order prevent erroneous

adjustment of the filter and reduce complexity. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Seki to have the adjustment of the single digital filter slower than processing a plurality of sound signals through the single digital filter such that it prevent abrupt changes in order prevent erroneous adjustment of the single digital filter and reduce complexity.

Seki as modified discloses:

converting the digital output signals to audio output signals (5); and

testing the audio output signals by broadcast of the audio output signals through a speaker to generate new audio input signals and analysis the effect of processing the digital input signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22).

Seki as modified discloses:

Seki as modified does not expressly disclose readjusting **the single digital filter** by adjustment of a depth of **the single digital filter** if a magnitude of the at least one candidate signal is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced. Lane discloses a method and apparatus for suppressing acoustic feedback in an audio system, comprising a bank of notch filters can be configured accordingly to attenuate detected feedback. In the case where the number of notch filters is limited, an allocation/de-allocation scheme can be implemented to optimize the attenuation of the feedback with the limited number of filters. This allocation/de-allocation scheme may include a first set of notch filters that are configured to a set of feedback frequencies that are inherent to the system, and

thus likely to remain constant during use. In this case, the allocation/de-allocation scheme may also include a second set of notch filters that are designated for feedback components that change regularly based on different variables in the system. The second set of notch filters would be re-configured regularly, while the first set may be static once initially configured (column 4, lines 5-20). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Seki as modified with the teaching of Lane to incorporate an allocation/de-allocation scheme to optimize the attenuation of the feedback while having limited number of filters. Therefore, Seki as modified discloses readjusting **the single digital filter** by adjustment of a depth of **the single digital filter** if a magnitude of the at least one candidate signal is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced.

77. Claim 27 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

78. Claim 28 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

79. Claim 29 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

80. Claim 30 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

81. Claim 31 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

82. Claim 32 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

83. Claim 33 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

84. Claim 34 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

Allowable Subject Matter

85. Claims 16-18, 23-25, 35-37, 48-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

86. Applicant's arguments with respect to claims 1-4, and 6-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

87. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P. Chau whose telephone number is (571)272-7514. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

August 21, 2006
CPC

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600